

REMARKS

This application is a divisional of U.S. Serial No. 09/793,874, filed February 27, 2001, allowed June 3, 2003, where Claim 13 was withdrawn from consideration by the Examiner and thereafter cancelled by Applicant. Claim 13 has been rewritten to include the features of the allowed claims in the parent application and is thus believed allowable as well. Claim 13 incorporates substantially the language of allowed Claim 1 of the parent application and is supported by original Claim 13 as well as the specification as originally filed at pages 11-12 and 15, 17 as noted below.

Specification, pp. 11-12	Specification, pp. 15, 17
<p>There is provided in a first aspect of the present invention a process for producing high bulk cellulosic fiber exhibiting a durable elevated curl index including the steps of: (a) concurrently heat-treating, bleaching and convolving cellulosic fiber pulp at elevated temperature and pressure at high consistency in a bleaching liquor, preferably under conditions selected so as to preclude substantial fibrillation and attendant paper strength and fiber bonding development and (b) recovering the pulp wherein the length weighted curl index of the treated fiber is at least about 20% higher than the length weighted curl index of the fiber prior to the heat treatment and convolving thereof. Typically, at least about 20% elevation of the length weighted curl index of the treated fiber persists upon treatment for 30 minutes in a disintegrator at 1% consistency at a temperature of 125°F. As will further be discussed below, the laboratory disintegrator is suitably operated at 3000 rpm and is of the type described in TAPPI Standard T205 Sp-95.</p>	<p>In many instances the fiber will include secondary (recycled ) fiber. In still other embodiments the fiber will consist essentially of secondary fiber or may be a mixture of virgin fiber and secondary fiber including from about 5 to about 95% by weight of secondary fiber based on the weight of fiber present in the pulp. In other instances, the fiber will be 100% recycle or secondary fiber. The present invention may be applied to any suitable pulp including Kraft hardwood fibers, Kraft softwood fibers, sulfite hardwood fibers, sulfite softwood fibers, and mixtures thereof. So also, the fibers may be mechanically pulped fibers, chemi-mechanically pulped fibers and mixtures thereof.</p> <p>Fibers suitable for treatment by the process include virgin kraft hardwood and softwood, mechanical and chemi-mechanical pulps, and secondary fibers.</p>

New Claims 64-72 correspond respectively to original Claims 27-32 and 39-41.

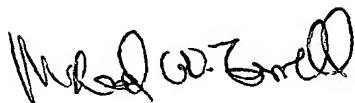
New Claim 73 is supported by the original text at page 14 noted below, as well as Examples 36-40 at pages 38-39 of the original specification. *Note* particularly Table 9, last column.

Specification, as filed, page 14
The curl index attained by way of practicing the present invention will to some extent depend upon the curl index of the fiber prior to treatment. In most cases, the treated fiber has a length weighted curl index of at least about 0.12. More preferably the curled fiber has a length weighted curl index of at least about 0.15 with minimum values of at least about 0.2, 0.25 or 0.3 being particularly preferred. Generally, the length weighed curl index is determined by standard procedure in an Op Test fiber analyzer, model number Code LDA 96 in accordance with the equations set forth hereinafter.

New Claims 74-79 correspond to original Claims 27-32 as well.

None of the art is believed to suggest the claimed invention and accordingly, this case is believed in condition for allowance.

Respectfully submitted,



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**ANNEX A**  
(clean version page 1, lines 5-8 of specification)

**Cross Reference to Related Application**

This patent application is a divisional patent application of U.S. Serial No. 09/793,874, filed February 27, 2001, now United States Patent No. \_\_\_\_\_, which application was based upon United States Provisional Application Serial No. 60/187,105 of the same title, filed March 6, 2000, the priorities of which are hereby claimed.

ANNEX B  
(marked-up version of page 1, lines 5-8 of specification)

Cross Reference to Related Application

This non-provisional application is patent application is a divisional patent application of  
U.S. Serial No. 09/793,874, filed February 27, 2001, now United States Patent No. \_\_\_\_\_,  
which application was based upon United States Provisional Application Serial No. 60/187,105 of  
the same title, filed March 6, 2000, the priority-priorities of which is are hereby claimed.

**APPENDIX A**  
(clean version of Claim 13 and new Claims 64-79)

13. (Amended) An absorbent sheet formed by:

- (a) bleaching cellulosic fiber and producing fiber with a durable elevated curl index by way of a process comprising:
  - (1) feeding a cellulosic pulp including Kraft fiber to a refining gap defined between opposed surfaces, at least one of the surfaces being rotatable with respect to its opposed surface;
  - (2) concurrently heat-treating, bleaching and convolving the cellulosic fiber pulp including Kraft fiber in the refining gap at elevated temperature and pressure at high consistency in a bleaching liquor under conditions selected so as to preclude substantial fibrillation and attendant paper strength and fiber bonding development;
  - (3) recovering said pulp wherein the length weighted curl index of the treated fiber is at least about 20% higher than the length weighted curl index of the fiber prior to said the non-destructive heat treatment, bleaching and convolving thereof; and
- (b) incorporating the Kraft fiber with the elevated curl index provided by way of steps (a)(1), (a)(2) and (a)(3) in the absorbent sheet.

64. (New) The absorbent sheet according to Claim 13, wherein said step of heat-treating and convolving said fiber has a duration of from about 0.01 to about 20 seconds.

65. (New) The absorbent sheet according to Claim 13, wherein said step of heat-treating and convolving said fiber has a duration of less than about 10 seconds.

66. (New) The absorbent sheet according to Claim 13, wherein said step of heat-treating and convolving said fiber has a duration of less than about 5 seconds.

67. (New) The absorbent sheet according to Claim 13, wherein said step of heat-treating and convolving said fiber has a duration of less than about 2 seconds.

68. (New) The absorbent sheet according to Claim 13, wherein said step of heat-treating and convolving said fiber is carried out at a temperature of from about 230°F to about 370°F.

69. (New) The absorbent sheet according to Claim 13, wherein mechanical energy input to said fiber during said heat-treating and convolving step is less than about 2 HP day/ton.

70. (New) The absorbent sheet according to Claim 13, wherein said fiber comprises secondary fiber.

71. (New) The absorbent sheet according to Claim 13, wherein said fiber consists essentially of secondary fiber.

72. (New) The absorbent sheet according to Claim 13, wherein said fiber consists of secondary fiber.

73. (New) An absorbent sheet incorporating secondary fiber which has been concurrently heat-treated and convolved wherein said secondary fiber has a curl index of at least about 0.12.

74. (New) The absorbent sheet according to Claim 73, wherein said step of heat-treating and convolving said secondary fiber has a duration of from about 0.01 to about 20 seconds.

75. (New) The absorbent sheet according to Claim 73, wherein said step of heat-treating and convolving said secondary fiber has a duration of less than about 10 seconds.

76. (New) The absorbent sheet according to Claim 73, wherein said step of heat-treating and convolving said secondary fiber has a duration of less than about 5 seconds.

77. (New) The absorbent sheet according to Claim 73, wherein said step of heat-treating and convolving said secondary fiber has a duration of less than about 2 seconds.

78. (New) The absorbent sheet according to Claim 73, wherein said step of heat-treating and convolving said secondary fiber is carried out at a temperature of from about 230°F to about 370°F.

79. (New) The absorbent sheet according to Claim 73, wherein mechanical energy input to said secondary fiber during said heat-treating and convolving step is less than about 2 HP day/ton.

**APPENDIX B**  
(marked-up version of Claim 13)

13. (Amended) An absorbent sheet incorporating fiber prepared in accordance with the process of Claim 1, formed by:

(a) bleaching cellulosic fiber and producing fiber with a durable elevated curl index by way of a process comprising:

(1) feeding a cellulosic pulp including Kraft fiber to a refining gap defined between opposed surfaces, at least one of the surfaces being rotatable with respect to its opposed surface;

(2) concurrently heat-treating, bleaching and convolving the cellulosic fiber pulp including Kraft fiber in the refining gap at elevated temperature and pressure at high consistency in a bleaching liquor under conditions selected so as to preclude substantial fibrillation and attendant paper strength and fiber bonding development;

(3) recovering said pulp wherein the length weighted curl index of the treated fiber is at least about 20% higher than the length weighted curl index of the fiber prior to said the non-destructive heat treatment, bleaching and convolving thereof; and

(b) incorporating the Kraft fiber with the elevated curl index provided by way of steps (a)(1),

(a)(2) and (a)(3) in the absorbent sheet.